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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ALASKA

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| In re Crash of Aircraft N93PC | ) | No. 3:15-cv-0112-HRH |
| | ) | [Consolidated with |
| on July 7, 2013, at Soldotna, Alaska | ) | No. 3:15-cv-0113-HRH and |
| | ) | No. 3:15-cv-0115-HRH] |

O R D E R

Honeywell's Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman

Honeywell International Inc. moves to exclude the testimony of plaintiffs' experts, Colin Sommer and Arthur Lee Coffman.[1] This motion is opposed.[2] Honeywell has withdrawn its request for oral argument,[3] and the court deems oral argument unnecessary.

Background

On July 7, 2013, a deHavilland DHC-3 "Otter" airplane operated by Rediske Air, Inc. and piloted by Walter Rediske crashed shortly after take-off from the Soldotna Airport.

[1]Docket No. 232.

[2]Docket Nos. 278 and 280.

[3]Docket No. 358.

Rediske and all of the passengers on board were killed in the crash. Plaintiffs, which are the estates of the passengers and Rediske, assert wrongful death, negligence, strict liability and breach of warranty claims against Honeywell.

The accident aircraft was powered by a Honeywell TPE 331 turbine engine, which "is a lightweight fixed-shaft engine designed to provide primary power for fixed wing aircraft."[4] "Output drive for the aircraft propeller is provided by gear trains which are driven by the rotating group of the engine. The engine main rotating group is made up of the compressor impellers, turbine rotors and shouldered shaft (main shaft)."[5] "A torsion shaft, positioned concentrically inside the main shaft, extends through the length of the main shaft."[6] "The torsion shaft is driven by a spline at the rear of the main shaft and drives the matched bearing and shaft set (high speed pinion) through a splined coupling at the front."[7] "The torsion shaft is designed to twist slightly with the application of power by the pilot; a torque sensor measures this twist to provide the pilot with an indication of engine power."[8] "The torsion

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[4]Overhaul Manual, Exhibit A at 1, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[5]Id.

[6]Id.

[7]Id.

[8]Honeywell's Memorandum in Support of its Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman at 4, Docket No. 233 (citing Honeywell TPE 331 Line Maintenance Manual at p. 7-10, Exhibit B, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232).

shaft has two bushings that sit in 'lands' on the shaft. The bushings are used to position the torsion shaft concentrically within the main shaft."[9]

Post-accident examination of the engine showed that the torsion shaft was sheared. Honeywell's position is "that the torsion shaft broke as a result of the load forces created when the propellor struck the ground during the crash sequence."[10] Plaintiffs' position is that the torsion shaft broke in flight. Plaintiffs offer the testimony of two experts to support their position, Colin Sommer and Arthur Lee Coffman.

Sommer is the "Vice President and Aircraft Mishap and Failure Investigator with Aeroscope, Inc."[11] Sommer has "a Bachelor of Science [degree] in engineering and civil and environmental engineering with an emphasis in structural design. . . ."[12] Sommer testified that he took basic course work in aerospace engineering but did not take advance aerodynamic course work.[13] He testified that his post-graduate formal training in accident investigation consisted of a two-week course at the NTSB Academy, a two-week course at

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[9]Id.

[10]Id. at 5.

[11]Curriculum Vitae of Colin A. Sommer, P.E., Appendix 2, Report of Findings, Exhibit C, Plaintiff's [sic] Responses to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

[12]Deposition of Colin Sommer at 8:21-24, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[13]Id. at 11:13-12:2.

the Southern California Safety Institute, and a week-long course at Teledyne.[14] Sommer testified that he did not think he had ever flown a DHC-3 aircraft with a TPE 331 engine.[15] Sommer has extensive experience investigating aircraft accidents, having "personally investigated over 350 different" accidents.[16]

Arthur Lee Coffman has 52 years of experience as a mechanic, inspector, maintenance administrator, and investigator.[17] But, Coffman is not an engineer.[18] Coffman testified that he does a little hands-on work on an aircraft "occasionally. I assist somebody with a rigging issue or something else it seems like every few months. But as far as . . . making a living working on an aircraft or engine on a daily basis, I haven't done that since about '91."[19]

In his expert report, Coffman opined that "[t]o a reasonable degree of probability the subject engine failed in-flight and was not producing power at the time of impact, due [to]

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[14]Id. at 12:6-18.

[15]Id. at 22:4-10.

[16]Appendix 2 -- Sommer CV at 2, Report of Findings, Exhibit C, Plaintiff's [sic] Responses to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

[17]Coffman Report at 1, Exhibit 1, Memorandum in Support of RAC's Motion in Limine No. 3 (Coffman), Docket No. 341.

[18]Video Deposition of Arthur Lee Coffman at 8:19-21, Exhibit D, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[19]Id. at16:5-9.

the failure of the torsion shaft bushing and the torsion, causing the accident."[20] Sommer opined in his expert report that

> 4. The torsion shaft aft bushing failed and caused heavy damage and scoring to the torsion shaft after bushing land.
> 5. The torsion shaft runout was far beyond normal specifications for type of application.
> 6. The torsion shaft in the subject Honeywell International, Inc. TPE331-10R-511C failed in-flight, shortly after departure from the Soldotna Airport in Soldotna, AK. This is evidenced by the damage to the torsion shaft bushing land and condition of the inner diameter of the main shaft.[21]

And it is Sommer's opinion that the failure of the torsion shaft, which caused the engine to lose power, combined with the pilot's improper loading of the accident aircraft, caused the crash.[22]

Honeywell now moves to exclude Sommer's and Coffman's opinions and testimony as they relate to the torsion shaft.

## Discussion

> Rule 702 of the Federal Rules of Evidence provides that expert opinion evidence is admissible if: (1) the witness is sufficiently

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[20]Coffman Report at 5, Exhibit 1, Memorandum in Support of RAC's Motion in Limine No. 3 (Coffman), Docket No. 341.

[21]Report of Findings at 21, Exhibit C, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

[22]Sommer Deposition at 128:7-10, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

> qualified as an expert by knowledge, skill, experience, training, or education; (2) the scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (3) the testimony is based on sufficient facts or data; (4) the testimony is the product of reliable principles and methods; and (5) the expert has reliably applied the relevant principles and methods to the facts of the case.

City of Pomona v. SQM North America Corp., 750 F.3d 1036, 1043 (9th Cir. 2014). "Before admitting expert testimony into evidence, the district court must perform a 'gatekeeping role' of ensuring that the testimony is both 'relevant' and 'reliable' under Rule 702." United States v. Ruvalcaba-Garcia, 923 F.3d 1183, 1188 (9th Cir. 2019) (quoting Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 597 (1993)).

"Relevancy simply requires that 'the evidence logically advance a material aspect of the party's case.'" Id. (quoting Estate of Barabin v. AstenJohnson, Inc., 740 F.3d 457, 463 (9th Cir. 2014)). "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." Daubert, 509 U.S. at 591 (citation omitted).

"'[R]eliability' . . . requires that the expert's testimony have 'a reliable basis in the knowledge and experience of the relevant discipline.'" Ruvalcaba-Garcia, 923 F.3d at 1188-89 (quoting Barabin, 740 F.3d at 463). "The district court must assess whether 'the reasoning or methodology underlying the testimony is scientifically valid' and 'properly can be applied to the facts in issue[.]'" Id. at 1189 (quoting Daubert, 509 U.S. at 592–93). "'The district court is not tasked with deciding whether the expert is right or wrong, just whether his testimony has substance such that it would be helpful to a jury.'" City of Pomona, 750

F.3d at 1044 (quoting Alaska Rent-A-Car, Inc. v. Avis Budget Group, Inc., 738 F.3d 960, 969-70 (9th Cir. 2013)). "The court must assess the expert's reasoning or methodology, using as appropriate[,] criteria such as testability, publication in peer-reviewed literature, known or potential error rate, and general acceptance." Id. "'But these factors are meant to be helpful, not definitive, and the trial court has discretion to decide how to test an expert's reliability as well as whether the testimony is reliable, based on the particular circumstances of the particular case.'" Id. (quoting Primiano v. Cook, 598 F.3d 558, 564 (9th Cir. 2010)).

Honeywell first argues that Sommer's testimony that analysis of the iPhone video reveals the moment that the torsion shaft broke is not reliable. Sommer testified that at approximately 50.5 seconds into this 3 minute and 16 second video taken by one of the passengers with an iPhone, there is a metallic sound and that this is when the torsion shaft failed.[23] Honeywell argues that Sommer is not qualified to offer this opinion because he is not a metallurgist and did not perform any tests to determine that the sound at 50.5 seconds was in fact "metallic." Honeywell also argues that Sommer is not qualified to offer this opinion because he has no specialized training or experience in performing audio analysis. Honeywell argues that these deficiencies are highlighted by the fact that plaintiffs retained a metallurgist, Mark Hood, and an expert in audio analysis, Frank Graham, neither of whom were asked to identify the so-called metallic sound.

[23]Sommer Deposition at 55:24-56:7, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

This argument fails. Sommer's training as an engineer and his training and experience as an aircraft accident investigator provide the necessary background for him to opine as to what a sound on the iPhone video represents.

But even if Sommer is qualified to opine as to what the metallic sound on the iPhone video represented, which he is, Honeywell argues that his opinion that the sound at 50.5 seconds was the torsion shaft failing should still be excluded because it is not supported by any reliable methodology. At his deposition, Sommer provided the following testimony:

> Q. Okay. And what is it about the torsion shaft failing that creates that particular sound?
> A. The only significant damage that we see in the engine is on the aft land of the torsion shaft other than the failure itself. The only explanation that is available for that metallic, screeching type noise would have to be the destruction of that land due to the interference and relative motion between the torsion shaft and the main shaft because we couldn't find anything else in the engine that would make that kind of a noise.
> Q. Did you give any consideration to the possibility that that metallic sound might be something from the rest of the aircraft and not from the engine?
> A. We explored the different options, but you don't really have any other components that I could conclude that would do that. The flaps wouldn't make that noise, and we don't see them change position anyway. The trim wheel wouldn't make that noise. The boost pump wouldn't make that noise. Control surfaces wouldn't make that noise. There isn't retractable gear so that couldn't make that noise. There isn't anything else that I know of in that aircraft that would be operating that would make that type of noise.
> Q. Okay. Did you actually take a DHC-3 Otter and try to create some of those noises and then compare the sounds you hear on the tape?

> A. You mean to break a torsion shaft?
> Q. Or the other noises that you were talking to, the boost pump, the trim wheel, the flaps, the gear.
> A. The boost pump, actually, you hear later in the video . . . after the aircraft crashes, and it is a significantly different noise. The flaps didn't change position because we can see that in the video. The trim wheel -- I've used dozens, hundreds of trim wheels, and I can't imagine how it would make that [noise]. But no, to answer your question, I did not do it in a DHC-3.[24]

Honeywell argues that this testimony indicates that Sommer summarily concluded that the noise at 50.5 seconds on the iPhone video must be the torsion shaft failing but that he performed no analysis or sound comparisons to reach this conclusion.

Honeywell acknowledges that Sommer contends that Frank Graham's opinion that there were "engine variations" heard right after the metallic sound supports his theory that the torsion shaft broke in flight. At his deposition, Sommer testified that Graham's

> [s]ound spectrum analysis showed that there were fluctuations in the prop/engine signatures. My belief is that that is in accordance with the engine spooling down and the governor trying to control the propeller speed. So as the power's lost to the drivetrain, the governor's going to flatten out the blades in an attempt to maintain RPM. And it's going to do that somewhat cyclically because it's a hysteresis based system that is going to chase the appropriate RPM. And that would be consistent with the loss of the torsion shaft.[25]

But when asked further about the significance of the engine fluctuations to his theory that the

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[24]Sommer Deposition at 56:8-57:25, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[25]Id. at 59:21-60:6.

torsion shaft sheared in flight, Sommer testified that he would defer to Graham for further analysis "as [Graham] did the sound spectrum analysis."[26] However, Honeywell points out that Graham testified that he did not reach any conclusions about the cause of the RPM changes that he detected.[27] This, Honeywell contends, is yet another indication that Sommer's opinion about the metallic sound being the torsion shaft failing is not supported by any reliable methodology.

Sommer's opinion about the metallic sound being the torsion shaft breaking is reliable. This is a case of two experts disagreeing. Honeywell's expert determined that the metallic sound was caused by movement of the trim wheel and Sommer testified that movement of the trim wheel would not make such a sound. Contrary to Honeywell's contention, Sommer did eliminate other possible origins of the sounds. As set out above, Sommer considered whether the boost pumps or flaps could have caused this sound and explained why they did not.[28] That Sommer did not do the testing that Honeywell is suggesting he should have done is not fatal. Sommer's opinion as to what the metallic sound represented is based on his experience and knowledge. The lack of testing may be a basis

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[26]Id. at 60:19-24.

[27]Videotaped Deposition of Frank Richard Graham, Jr. at 120:18-20, Exhibit E, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[28]Sommer Deposition at 56:10-57:8, Exhibit B, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

for Honeywell to attack Sommer's opinion on cross-examination, but it is not a basis for excluding Sommer's opinion about what the metallic sound on the video represented. See Hemmings v. Tidyman's Inc., 285 F.3d 1174, 1188 (9th Cir. 2002) ("objections to the inadequacies of" an expert's analysis "are more appropriately considered an objection going to the weight of the evidence rather than its admissibility"). Sommer's opinion about the metallic sound being the torsion shaft failing is not unreliable and thus will not be excluded.

Honeywell next argues that Sommer's and Coffman's opinions that the torsion shaft broke during flight are unreliable because they are not based on reliable principles and methods. Honeywell argues that Sommer's and Coffman's opinions are based on nothing more than speculation about what might have caused the torsion shaft to break and that they did not do any metallurgical or materials analysis, shear strength testing, or functional testing on exemplar torsion shafts to either confirm or rule out causes of the torsion shaft failure. In fact, Honeywell points out that at his deposition, Sommer testified that in some cases, "it's possible that the torsion shaft fails because it fails. That's not a very engineering, scientific approach, but they don't indicate any reason. So we at least have some history that that can happen."[29] Coffman testified in response to the question, "[d]o you have an opinion about what caused th[e] fracture of the torsion shaft?", as follows:

> I have no way to prove this or anything. I think it's possible

[29]Sommer Deposition at 106:23-107:2, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

> since this bushing causes more damage than I've ever seen before, did it freeze up prior to spinning? I can't -- I have no way of proving that except it is a possibility. In other words, we know that bushings can stick to one surface or the other. Or I've seen that occur, that they kind of bound up against the torsion shaft or against the main shaft. In this one after it spun, I can't say what it did, what it looked like prior to the spinning. I know that the bushing -- I don't know whether this bushing totally deteriorated, whether there's pieces in there that fell out that I can't -- I haven't seen.[30]

Honeywell argues that Sommer's and Coffman's failure to use objective testing or any other analytical methods to confirm a theory of liability is especially suspect given that plaintiffs retained Hood, a registered professional engineer in materials and metallurgy, who testified that he was unable to find any material defects in the torsion shaft through metallurgical materials analysis.[31]

Plaintiffs, however, argue that Honeywell has failed to look at the overall methodology employed by Sommer and Coffman. In his original expert report, Sommer stated that he followed "the guidance and investigative techniques found in numerous widely accepted investigation manuals[.]"[32] This, along with Sommer's review of the physical evidence,

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[30]Coffman Deposition at 22:1-16, Exhibit D, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[31]Deposition of Mark B. Hood, P.E., at 35:22-36:1, Exhibit H, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[32]Report of Findings at 21, Exhibit C, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

including the propellers, the compressor section, the turbine section, and the torsion shaft, as well as his analysis of the iPhone video, shows, according to plaintiffs, that Sommer's opinion was based on sufficient facts and data and on reliable principles and methods. Similarly, plaintiffs argue that Coffman based his opinion on the physical evidence, such as the light rubbing within the engine and very light blade splatter, as well as his 52 year experience as a mechanic, inspector, maintenance administrator, and investigator.[33] Plaintiffs argue that Coffman's and Sommer's opinions are further supported by the testimony and opinions of Hood, who opined that the engine failed in flight, an opinion that is based on Hood's examination of the physical evidence.[34]

To the extent that plaintiffs are arguing that Sommer's experience and expertise alone provide a sufficient basis for his opinions, Honeywell disagrees. Honeywell contends that Sommer does not have any training in aircraft propulsion, has never designed a component for a turbine engine, has never piloted an Otter aircraft, and has never piloted an aircraft with a TPE331 engine. In other words, according to Honeywell, Sommer does not have the requisite experience and expertise to offer opinions about what happened to the engine in the accident aircraft. As for Sommer's contention that he is relying on Graham's conclusion that the engine speed was fluctuating between 97-101% RPMs before impact, Honeywell again

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[33]Coffman Report at 1, 4-5, Exhibit 1, Memorandum in Support of RAC's Motion in Limine No. 3 (Coffman), Docket No. 341.

[34]Hood Deposition at 12:24-15:8, 19:19-20:2, 21:18-22:7, Exhibit E, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

contends that Graham did not opine as to why these fluctuations were happening or try to correlate them to any actions by the pilot. Honeywell argues that this means that Sommer has no support for his testimony that a torsion shaft failure would have caused fluctuations within that range and that he has dismissed, without any basis for doing so, the possibility that the fluctuations could have been caused by pilot input.

Honeywell also argues that the physical evidence that plaintiffs are contending that Sommer and Coffman relied on had nothing to do with the existence of a defective torsion shaft or bushing but rather go to the question of whether the engine was producing full power at the time of impact. Although Honeywell acknowledges that Sommer and Coffman are opining that the engine was not producing full power because of the torsion shaft failure, Honeywell contends that in doing so they are ignoring all of the other potential causes for a reduction in engine power. In short, Honeywell argues that Sommer's and Coffman's review of the physical evidence does not provide sufficient support for their opinions about when the torsion shaft broke but rather illustrate that Sommer's and Coffman's theories are not the product of reliable principles and methods and sufficient facts and data.

Sommer's and Coffman's opinions that the torsion shaft failed during flight are sufficiently supported by their experience and knowledge and their review of the physical evidence. Honeywell's arguments on this issue go more to the weight that Sommer's and Coffman's opinions should be given than to the admissibility of their opinions.

Honeywell next challenges Sommer's reliance on the bend in the torsion shaft, which was found on post-accident examination. Honeywell disputes that this is evidence that the torsion shaft broke in flight, as Sommer opines. At his deposition, Sommer testified that

> if you lost the support of the shaft and the shaft bent to where instead of having the shaft supported on both ends and the shaft supported with both bushings, if you now have this long, unsupported section of a bent shaft, then perhaps you could have enough side load due to the very high speed of the shaft to where you could break the shaft.[35]

Sommer testified that there must have been a manufacturing defect in the torsion shaft back in 1998 when it was installed in the engine because he did not "know of any other way that it would get bent like that, that is the only conclusion that one could make."[36] But Honeywell argues that Sommer had not tested his theory, even though he admitted that it would be possible to do so.[37] Honeywell insists that any opinion Sommer has about the bend in the torsion shaft being a manufacturing defect is based on nothing more than speculation and that because Sommer is not a metallurgical expert, he is not qualified to offer opinions about whether there was a manufacturing defect in the torsion shaft. Honeywell emphasizes that Sommer offered this opinion without even having seen the manufacturing/engineering

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[35]Sommer Deposition at 109:25-110:7, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[36]Id. at 106:2-8.

[37]Id. at 109:18-23.

drawings.[38] At his deposition, the following exchange took place:

> Q. Is it your opinion that the bend in the torsion shaft was present when the engine was operating in the air?
> A. I'm not sure that it's 100 percent possible to know whether or not the bend in the torsion shaft could have occurred during the fracture of the shaft. Because the shaft should be supported by the bushings in two different locations which are supposed to keep the centerline of the shaft uniform, I wouldn't expect a shaft of this hardness to bend like that just from a torsion break. The torsion break would be somewhat uniform. The shaft is supported. I wouldn't think that it would be likely, and would be more likely than not that it was bent prior. But post accident I'm not sure that there is a 100 percent guaranteed way to know that.
> Q. So your opinion is it's more likely than not that that bend in the torsion shaft was present in operation?
> A. Yes.
> Q. And how did it get bent?
> A. I can't answer that. I don't know what the specs were because I've never seen any manufacturing documentation on the shaft so I've never seen where they did the runout check and then compared that runout check to what the drawing says. And actually, in this case I've never seen the drawing for the shaft so I don't know exactly what the runout should be, but it should be on the order of a few thousandths. But it could have been bent during manufacturing. And maybe it was material reviewed and approved, or maybe it was bent during operation because of the loads that are on it. Of course, that's going to be dependent upon the bushing maintaining its concentricity. And as the bushing fails, that concentricity is going to be compromised.[39]

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[38]Sommer had not reviewed the drawings because Honeywell had not yet produced them.

[39]Sommer Deposition at 42:20-44:4, Exhibit C, Honeywell International Inc.'s Motion (continued...)

Honeywell also emphasizes that Hood did not attempt to determine the cause of the bend in the torsion shaft. In response to a question as to whether he did any analysis to determine why the torsion shaft bent, Hood testified that this "wasn't part of [his] analysis," although he testified that he "didn't see anything that indicated that there was post-accident damage that would be responsible for that bend."[40]

To the extent that Sommer is opining that the bend in the torsion shaft was a manufacturing defect, that opinion is excluded as unreliable. Sommer's opinion on this issue is nothing more than speculation. Sommer has offered no support for this opinion. He testified that the bend in the torsion shaft was present during operation but offers no explanation as to how the accident aircraft operated for years without incident despite this alleged defect. As Sommer acknowledged, he could have tested his theory that the bend in the torsion shaft was a manufacturing defect. His failure to do so in this instance results in an unsupported, unreliable opinion.

Honeywell next argues that the fact that the aft bushing was destroyed does not support Sommer's and Coffman's opinions that the torsion shaft broke during flight. Honeywell argues that Sommer and Coffman are speculating about the possible effect of one of the torsion shaft bushings binding in flight. Specifically, Sommer testified that

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[39](...continued)
to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[40]Hood Deposition at 51:1-23, Exhibit H, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

> [i]f the bushing is to bind because of its location in the rear of the engine where it's much hotter due to the turbine section -- if the bushing is to bind either because the bushing is improperly sized or because of the excess heat and coking, which Honeywell indicates can happen to both the shaft, the torsion shaft and the main shaft, you are now going to get an improper torque indication in the cockpit. And a pilot is going to look at his torque gauge and believe that he has less torque on his engine than he really has. And if he is to believe that torque gauge and then to apply greater torque to the engine because he believes he has a margin there -- and more likely than not, this engine would have been torque-limited on this flight as opposed to temp-limited -- then he could possibly overtorque the engine, breaking the torsion shaft because of the bound bushing between the two components.[41]

Honeywell argues that Sommer offers many "ifs" and "possibilities" but has no evidentiary basis for his speculation that the aft bushing on the accident aircraft was improperly sized or subjected to excessive heat and coking or that there was an erroneous torque gauge reading on the day of the accident. Honeywell acknowledges that Hood testified that if the bushing "adhered to both" the main shaft and the torsion shaft "momentarily and then released, [there] would be a sudden . . . change in the torque loading at the aft end of . . . the shaft. I can see that as one way to . . . shear the shaft."[42] But, Honeywell contends that Hood did not test his theory either. Rather, Hood testified that he had not tried to calculate what the momentary torque load would be if the bushing were momentarily to adhere to both the main

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[41]Sommer Deposition at 48:5-22, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[42]Hood Deposition at 25:4-8, Exhibit H, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

shaft and torsion shaft and then release.[43] Honeywell contends that Coffman also did nothing to test this theory. Coffman testified at his deposition that

> [i]f we have binding at the rear bushing and it's not free to measure the twist from one end to the other, it could be causing a low torque reading in the cockpit, which the pilot may be applying more torque. And it's just one of those things. I say it's possible. Have I proved it? No. It's just I try to look at all things that I've seen in the ag world and various things and say I believe it's probably possible.[44]

Thus, Honeywell argues that Sommer's and Coffman's opinions as to the effect that the binding of the bushing might have had on the torsion shaft are completely unsupported and as such, are not reliable.

Sommer's and Coffman's opinions as to the effect of the binding of the aft bushing are reliable. Sommer explained at his deposition that

> it is obvious that there was significant binding between the rear bushing and the main shaft. We don't know what happened to the rear bushing. It should have been there, or pieces of it should have been there during the Honeywell teardown. I can't imagine that the bushing was completely washed away and gone, or else you would have found pieces of it in the oil filter. But you should have found pieces of it during the teardown. I don't know what Honeywell did with the components. I would expect them to be there.
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> But the binding of that bushing is so significant because of the heavy scoring and damage to the rear land of the torsion shaft that it is indicative of both relative rotation of the torsion

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[43]Id. at 30:3-21.

[44]Coffman Deposition at 25:8-16, Exhibit D, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

> shaft to the main shaft and some sort of a defect in the bushing or the land of the torsion shaft prior to installation. [45]

In other words, Sommer has explained the significance of the physical scoring of the bushing landing, that this would account for an over torque situation. Sommer's opinion about the effect a bound bushing might have is supported by sufficient facts and data.

Similarly, Coffman's bushing opinion is reliable because it is supported by sufficient facts and data. Coffman testified that "[i]f we have binding at the rear bushing and it's not free to measure the twist from one end to the other, it could be causing a low torque reading in the cockpit, which the pilot may be applying more torque" and that this overtorque could cause a shock to the torsion shaft, causing it to shear.[46]

The fact that Sommer and Coffman may have used the words "probably" and "if" when expressing and explaining their opinions does not mean that their opinions are unreliable. An expert does not have to testify that he is 100% certain that something would happen. Rather, an expert may opine as to probable causes, after eliminating unlikely or improbable causes.

Finally, Honeywell argues that Sommer's and Coffman's opinions that the torsion shaft failed in flight are not relevant. "The jury is not permitted to speculate in choosing one

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[45]Sommer Deposition at 41:20-42:12, Exhibit B, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

[46]Coffman Deposition at 25:8-26:10, Exhibit D, Plaintiff's [sic] Response to Honeywell's Motion in Limine to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 278.

of alternative possibilities, but is restricted to reasonable inferences based upon facts." Victorian Condominium Owners Association v. Fireman's Fund Ins. Co., Case No. C11-1002-JCC, 2012 WL 13028242, at *3 (W.D. Wash. Oct. 2, 2012) (citation omitted). Honeywell argues that Sommer and Coffman are offering opinions that suggest a possible cause of the accident and thus if the jury were allowed to hear their opinions, the jury would be left to speculate about the cause of the torsion shaft failure. Because their opinions would only allow the jury to speculate, which is not permitted, Honeywell argues that Sommer's and Coffman's opinions as to the cause of the torsion shaft failure are not relevant.

Plaintiffs argue that if the jury were to accept Sommer's and Coffman's opinions, the jury would not be forced to speculate. Plaintiffs insist that Coffman and Sommer have opined that the torsion shaft failed in flight and explained why they believe it failed at that time, rather than on impact. These opinions, according to plaintiffs, are based on reliable investigative principles and reasonable inferences and the jury should be allowed to hear them.

In reply, Honeywell argues that in their response, plaintiffs are attempting to merge two hypothetical manufacturing defects into a singular, untested theory of causation. Honeywell points out that Sommer testified that there were two possible manufacturing defects that could have caused the torsion shaft to break. At Sommer's deposition the following exchange took place:

> Q. Okay. So that's -- so we now have -- we have two mechanisms by which the shaft could be broken, am I

> correct? One is if you have erroneous torque indications and the pilot overtorques the engine? The other is side loading because the shaft is bent?
> A. It's possible.
> Q. Okay. Any others?
> A. Other than bad metal, which Mr. Hood didn't find, I would say that's about it.[47]

Honeywell contends that plaintiffs are now trying to pass these two theories off as one in order to avoid the argument that Sommer's and Coffman's opinions would require the jury to speculate in choosing one possible alternative.

Honeywell's relevancy argument is not persuasive. Sommer's and Coffman's opinions that the torsion shaft broke during flight are relevant.

## Conclusion

Honeywell's motion to exclude the testimony of Sommer and Coffman as it relates to the torsion shaft[48] is granted in part and denied in part. The motion is granted as to Sommer's opinion that the bend in the torsion shaft was a manufacturing defect. The motion is otherwise denied. Sommer's and Coffman's opinions that the torsion shaft broke in flight are both relevant and reliable.

DATED at Anchorage, Alaska, this 22nd day of April, 2020.

/s/ H. Russel Holland
United States District Judge

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[47]Sommer Deposition at 110:8-17, Exhibit C, Honeywell International Inc.'s Motion to Exclude the Testimony of Colin Sommer and Arthur Lee Coffman, Docket No. 232.

[48]Docket No. 232.